REMARKS

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The first of the attached pages is captioned "Version with markings to show changes made."

Claims 1-10 and 17-21 were pending in the parent of the above-identified application when last examined. Applicant has amended Claims 1, 4, 6, 7, 17, 19, and 21, cancelled Claims 5 and 20, and added Claims 22-45. Applicant respectfully requests reconsideration, further examination, and favorable action in this case.

The Examiner rejected Claims 1-10 and 17-21 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,678,059 ("Ramaswamy et al."). Specifically, the Examiner stated:

> Applicant argued that Ramaswamy provide no indication or suggestion that program 411 (MODEM.EXE) contains a UART emulation. The argument is not persuasive because it is known in the art that application program that communicate [sic] to a modem use routine calls that access a UART (see applicant own disclosure pages 2-3). Ramaswamy discloses that the program 411 (MODEM.exe) enable application programs to communicate with modem 409 as if it is a conventional modem without modification to the application programs (see col.3 lines 47-61). The MODEM.exe provides proprietary interface to device 409 but provides the communication to the application program like a conventional modem. Clearly, this imply [sic] that the MODEM.exe has a UART emulation to enable the application program to communicate to the modem 409 using UART routine calls. In any event, the MODEM.exe is equivalent to the claimed UART emulator because they both perform the same function - mapping calls for a conventional modem interface to another proprietary interface.

Final Office Action of 12/29/2000, p. 2. Applicant respectfully traverses.

Applicant respectfully submits that the Examiner's statement about Applicant's background statements on pages 2 and 3 is incorrect. Instead of stating that application programs directly access a UART, Applicant states that an operating system acts as an intermediate layer between application programs and the UART: specifically, the operating system provides support for the UART, and provides a library of subroutines that an application program may call to communicate with the UART, as follows (see the specification at page 2, line 11 to page 3, line 10):

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> Common devices connected to an ISA bus include serial input/output (I/O) devices such as a printer, a modem, or a mouse. Some operating environments such as Microsoft WINDOWS™ running in conjunction with MS-DOS operating system provide for standardized connections to serial devices coupled to the ISA bus. In particular, WINDOWS™ and MS-DOS support four communication or COM ports, each having a predefined base device address. This allows resolution of device address conflicts if each serial device coupled to the ISA bus has settings for at least four different base device addresses. Each COM port is for connection to a serial device which contains a communication interface known as a Universal Asynchronous Receiver/Transmitter (UART). The UART is well known in the art and described, for example, in the 1994 "Telecommunication Data Book" from National Semiconductor Corporation, which is incorporated by reference herein in its entirety.
>
> Fig. 1 illustrates conventional communications between a serial device 110 and an application 140 via an operating environment 130 and a communications driver 120. Operating environment 130 provides a library of subroutines which application 140 calls to communicate with serial device 110. The subroutines call communications driver 120 which writes and reads data and control information to and from a UART 105. The standardized communication interface illustrated in Fig. 1 reduces the complexity of application 140 because application 140 is not required to implement a variety of communication protocols. Accordingly, most application's are written for the standard interface. However, a standard hardware UART may be unsuitable or too expensive for some devices. Accordingly, techniques are needed which provide non-standard devices with the benefits of standard UART interface.

As seen from the above-quoted text, a UART is accessed only through an operating system as described by Applicant. Therefore, the "UART routine calls" mentioned by the Examiner may be made by the operating system, which in turn provides a standardized communication interface to applications. Applicant submits that it is the standardized communication interface of the operating system in Ramaswamy et al. that enables "application programs to communicate with modem 409 as if it is a conventional modem without modification to the application programs" as stated by the Examiner.

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Even the Ramaswamy et al. reference cited by the Examiner indicates that MODEMS.EXE software program 411 is coupled through the Windows operating system 304 to the various application programs 301, 302 and 403 as illustrated in Fig. 4 of Ramaswamy et

al. In this context, Applicant brings to the Examiner's attention Ramaswamy et al.'s teaching that "each of the applications 301, 302 and 403 communicates . . .via computer instructions known as 'function calls' . . ." (see column 3, lines 63-67). There is no statement in the Ramaswamy et al. reference that any such "function calls" are the "UART routine calls" mentioned by the Examiner.

Applicant submits that the Ramaswamy et al. patent is silent as to the specific manner in which "software program 411, referred to as modeum.exe" communicates with DSP 102. Specifically, Ramaswamy et al. at most state that "the interface to the DSP hardware is typically a proprietary one" (Col. 4, lines 47-48). Ramaswamy et al. further state that a uniform software layer (known as "COM driver") "readily permits the replacement of the UART functionality with an arbitrary interface" (Col. 3, lines 8-10).

In view of such teachings by Ramaswamy et al., there is no suggestion or motivation for any application program to use "UART routine calls". Instead, all application programs use a set of functions provided by the Microsoft Windows operating system to communicate with the COM driver through the operating system. These functions are not "UART routine calls", at least because a register set of a UART is not directly accessible to the application programs. See the attached Exhibit A entitled "Communication Drivers" from "Windows 3.1 Device Drivers Adaptation Guide." Thus, application programs call the Microsoft Windows operating system, and the Microsoft Windows operating system in turn calls the COM driver. As well known in the art, the Microsoft Windows COM driver provides a set of functions to be used when communicating with a UART as noted in Exhibit A. Application programs 301, 302 and 403 in the Windows operating system 304 (see Ramaswamy et al.) are therefore likely to access the operating system which in turn invokes the COM driver, instead of using "UART routine calls" mentioned by the Examiner.

In addition, independent Claim 1 distinguishes over Ramaswamy et al. by at least reciting "<u>a communication driver</u> . . . comprising a UART emulation." (emphasis added). The Examiner cites a program 411 in Ramaswamy et al. as a communication driver including a UART emulation. However, Ramaswamy et al. discloses that program 411 is an application program instead of a communication driver. Ramaswamy et al. states, "The difference between FIGS. 3 and 4 is the inclusion of application program 403, modified COM driver

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410, software application program 411 and modem 409." Ramaswamy et al., col. 3, lines 53-55.

Application software and communication drivers are different from each other. Ramaswamy et al. also discloses that application software and communication drivers are at different layers of an operating system architecture.

> The evolution of communication application software for the MS-DOS operating system used in the PC requires serial communications between the PC and peripherals to pass this UART. Typically each application program provided its own software layer to interface with this UART. In more recent operating systems, such as the Microsoft Windows operating system, a uniform software communications driver, known as "COM driver", is provided between the UART and the rest of the operating system. All modem communications software are forced to use this software layer. Indeed, all communications destined for any parallel or serial communication port passes through the COM driver.

Col. 2, line 61 to col. 3, line 10. Thus, Ramaswamy et al. fails to disclose "a communication driver comprising . . . a UART emulation," as recited in Claim 1. Accordingly, Claim 1 is patentable over Ramaswamy et al. Claims 2 and 3, which depend from Claim 1, are patentable over Ramaswamy et al. for at least the same reasons as Claim 1.

Independent Claims 17 and 19 distinguish over Ramaswamy by at least reciting a "communications driver ... comprising a UART emulation." For the reasons given above in regard to Claim 1, Ramaswamy et al. fails to disclose or suggest a communication driver including a UART emulation. Accordingly, Claims 17 and 19 are patentable over Ramaswamy et al. Claims 18 and 21, which depend from Claims 17 and 19 respectively are patentable over Ramaswamy et al. for at least the same reasons as Claims 17 and 19.

Independent Claim 4 distinguishes over Ramaswamy et al. for at least reciting "transmitting a packet formatted for a UART via a communications driver including a UART emulation." For the reasons given above in regard to Claim 1, Ramaswamy et al. fails to disclose a communication driver including a UART emulation. Accordingly, Claim 4 is patentable over Ramaswamy et al. Claims 6-10, which depend from Claim 4, are patentable over Ramaswamy et al. for at least the same reasons as Claim 4.

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New Claims 22 and 23, which depend from Claim 19, are patentable over the cited references for at least the same reasons as Claim 19.

New independent Claim 24 recites a "communication driver comprising a software modem," which is not disclosed or suggested by the cited references either alone or in combination. Accordingly, Claim 24 is patentable over the cited references. Claims 25-28, which depend from Claim 24, are patentable over the cited references for at least the same reasons as Claim 24.

New Claims 29-45 are supported by the originally filed disclosure including, for example, page 13, lines 7-34. New Claims 29-45 are believed to be patentable over the teachings of Ramaswamy et al., at least because Ramaswamy et al. states that "the software program 411 couples its output to modem 409 wherein the digital signal processing function performed in a modem is carried out" (column 4, lines 41-43). There is no statement or suggestion whatsoever by Ramaswamy et al. that the functions of the digital signal processing (DSP) hardware are performed in software program 411.

Applicant wishes to bring to the Examiner's attention a number of references attached hereto and identified in form PTO-1449 that is being filed concurrently herewith. Some of these references were cited during litigation in a suit at the US International Trade Commission, entitled "Certain HSP Modems, Software and Hardware Components Thereof, and Product Containing the Same", Investigation No. 337-TA-439. The just-described suit concerns U.S. Patent 5,787,305 which issued from an application to which the current application claims priority. For additional information on this suit, the Examiner is referred to the website http://www.usitc.gov. Moreover, the just-described U.S. Patent 5,787,305 is under re-examination. Other references attached hereto and identified in form PTO-1449 are cited in the re-examination of U.S. Patent 5,787,305.

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In summary, Claims 1-10 and 17-21 were pending in the application. Applicant has amended Claims 1, 4, 6, 7, 17, 19, and 21, cancelled Claims 5 and 20, and added Claims 22-45. For the above reasons, Applicant respectfully requests allowance of Claims 1-4, 6-10, 17-19, and 21-45. Should the Examiner have any questions concerning this response, the Examiner is invited to call the undersigned at (408) 487-1526.

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Respectfully submitted,

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In the Specification

The paragraph starting at page 1, line 23, and ending at page 1, line 29, is amended as follows:

> This invention relates to a computer system including a device having a non-standard I/O interface coupled to a local bus and a software emulation of a universal asynchronous receiver transmitter (UART), and further relates to processes and **[circuit]** **circuits** for avoiding conflicts when assigning a COM port to a non-standard device.

The paragraph starting at page 1, line 32, and ending at page 2, line 10, is amended as follows:

> A typical personal computer (PC) has one or more **[a]** local buses such as ISA, VESA, and/or PCI buses for connection of user-selected devices. The PC communicates with the devices using device addresses typically indicated by settings of jumper wires or toggle switches on the device. Problems can arise because there is no guaranty that a set of devices, made by different manufacturers, can operate together without address conflicts. Even if a set of devices can operated together, connection of the devices to a local bus may require that the user identify address conflicts and change address settings to avoid the conflicts. This can make adding devices to a PC difficult.

The paragraph starting at page 2, line 11, and ending at page 2, line 29, is amended as follows:

> Common devices connected to an ISA bus include serial input/output (I/O) devices such as a printer, a modem, or a mouse. Some operating environments such as Microsoft WINDOWS™ running in conjunction with MS-DOS operating system provide for standardized connections to serial devices coupled to the ISA bus. In particular, WINDOWS™ and MS-DOS support four communication or COM ports, each having a predefined base device address. This allows resolution of device address conflicts if each serial device **[on]** coupled to the ISA bus has settings for at least four different base device addresses. Each COM port is for connection to a serial device which contains a communication interface known as a Universal Asynchronous **[Receiver/Transceiver]** **Receiver/Transmitter** (UART). The UART is well known in the art and described, for example, in the 1994

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"Telecommunications Data Book" from National Semiconductor Corporation, which is incorporated by reference herein in its entirety.

The paragraph starting at page 2, line 30, and ending at page 3, line 10, is amended as follows:

Fig. 1 illustrates conventional communications between a serial device 110 and an application 140 via an operating environment 130 and a communications driver 120. Operating environment 130 provides a library of subroutines which application 140 calls to communicate with serial device 110. The subroutines call communications driver 120 which writes and reads data and control information to and from a UART 105. The standardized communication interface illustrated in Fig. 1 reduces the complexity of application 140 because application 140 is not required to implement a variety of communication protocols. Accordingly, most **[application's]** **applications** are written for the standard interface. However, a standard hardware UART may be unsuitable or too expensive for some devices. Accordingly, techniques are needed which provide non-standard devices with the benefits of a standard UART interface.

The paragraph starting at page 3, line 25, and ending at page 4, line 5, is amended as follows:

In one embodiment of the invention, a computer system includes a non-standard device and a COM driver for the non-standard device. The non-standard device connects to an I/O slot corresponding to a first COM port but has a register set which differs from the standard register set for a UART. The COM driver contains: a UART emulation which in response **to** a procedure requesting access to a register of a UART at the first COM port, instead accesses storage locations in main memory of the computer system; and an I/O handler which transfers values between the storage locations in main memory and the register set of the device. Optionally, the system includes a standard device having a UART coupled to an I/O slot corresponding to a second COM port, and the COM driver contains routines for accessing the standard device.

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The paragraph starting at page 5, line 29, and ending at page 5, line 36, is amended as follows:

In one embodiment of the **[invention]** **invention,** operating environment 130 includes **[microsoft]** **Microsoft** WINDOWS™ which supports four COM

ports for communications with up to four serial devices connected to an ISA bus 115. A standard COM port occupies a slot of eight addresses on ISA bus 115. The eight addresses correspond to registers of a standard UART, which function as shown in Table 1.

The paragraph starting at page 7, line 13, and ending at page 7, line 28, is amended as follows:

During initialization of COM ports, COM driver 220 determines which of the four COM ports are allocated to standard UART devices, determines if a non-standard device is present, and then allocates an unassigned COM port and I/O slot to device 210. Serial device 210 is initially locked during start-up. When locked, serial device 210 receives a data signal DATA and address signal ADDR from ISA bus 115, but does not **[responds]** **<u>respond</u>** to any address. COM driver 220 unlocks device 210 by transmitting address signal ADDR and data signal DATA with values equal to <u>a</u> predefined pattern recognized by device 210. When unlocked, the base device address of device 210 depends on information that COM driver 220 provides while unlocking device 210. Device 210 replies to the address **[set]** **<u>sent</u>** by COM driver 220 to indicate that device 210 is present.

The paragraph starting at page 8, line 1, and ending at page 8, line 19, is amended as follows:

Unlocking circuit 300 contains a base address decoder 330 and a pattern generator 310. While the device is locked, base address decoder 330 asserts a signal SEL to pattern generator 310. Pattern generator 310 generates a signal PAT that represents a byte which is from a predefined sequence and corresponds to the value of signal SEL. Signal SEL starts in an initial state, such as indicating a count value of zero or a maximum count. Each time the local bus carries an address signal ADDR having a recognized value, base address decoder 330 compares data signal DATA from the local bus to signal PAT and if signals PAT and DATA are equal, changes signal SEL so that signal SEL advances toward a final state. Otherwise, signal SEL is reset **[to indicate]** to the initial state. Advancing signal SEL can for example increment a count value from an initial state (minimum value) toward a final state (maximum value) or decrement the count from an initial state (maximum value) to a final state (minimum value).

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The paragraph starting at page 8, line 28, and ending at page 9, line 8, is amended as follows:

Fig. 3B shows a block diagram of an embodiment of base address decoder 330. Base address decoder 330 contains AND gates 331, 332, and 333 which are coupled **to** address lines of ISA bus 115. AND gate 333 asserts a signal ADX when signal IOWCN indicates the computer is writing data and address signal ADDR[11:0] has the form 001x 111x 1111 binary where x indicates that bits ADDR4 and ADDR8 are "don't care" bits, i.e. can have either value 0 or 1. The COM driver selects values for bits ADDR8 and ADDR4 so that signal ADDR[11:0] does not correspond to any other device coupled to the ISA bus. A signal AEN indicates when a DMA controller in the computer places an address on ISA bus 115. In the embodiment shown, unlocking circuit 300 does not respond to the DMA controller, and signal ADX is only asserted if signal AEN indicates address signal ADDR[11:0] is not from the DMA controller.

The paragraph starting at page 10, line 20, and ending at page 10, line 32, is amended as follows:

Many alternative patterns and pattern generators may be used in place of the embodiment shown in Fig. 3C. For example, pattern generator 310 can be implemented using a memory such as a read-only memory where signal SEL[2:0] is an address signal or implemented using combinatorial logic where signal SEL[2:0] is an input signal. Each value in the pattern can be longer or shorter than a byte and can be a constant value independent of signal SEL. Further, the predetermined pattern can be longer or shorter **[that to]** **than** five values. Increasing the length of the pattern reduces the chance of a device being unintentionally locked.

The paragraph starting at page 11, line 13, and ending at page 11, line 25, is amended as follows:

Signals PCA4 and PCA8 are latched when an address signal ADDR[11:0] is asserted for a byte following the predefined pattern. The byte following the predefined pattern does not match signal PAT[7:0] from pattern generator 310. Accordingly, counter 335 is reset to the initial state, and bit SEL2 is cleared. Signals PCA8 and PCA4 do not change unless the predefined pattern is retransmitted. Unintentional transmission of the predefined pattern is unlikely during normal operation of the computer system, but if desired, COM driver 220 **will**

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monitor the pattern being transmitted and prevent repetition of the predefined pattern, for example by writing a no-op value to device 210.

The paragraph starting at page 12, line 29, and ending at page 13, line 6, is amended as follows:

In the register set of Table 2, the data registers are for 16-bit data words sent to DAC 207 or received from ADC 206 by the host computer. Input/output port register are for modem functions such as ring detection and control of an on-off hook relay (to connect or disconnect device **[208]** <u>210</u> to an active phone line) which are implemented by hardware in serial device 210. The control/status register are general purpose control and status bit for serial device 210.

<u>In the Claims</u>

Please amend Claims 1, 6, 7, 17, 19 and 21 as follows.

1. (Amended four times) A system comprising:

a computer having a processing unit, a main memory, and a local bus;

a device coupled to the local bus, wherein the device occupies an I/O slot on the local bus and is accessible at a first set of [address] <u>addresses</u> corresponding to a first communications port, and the device has a register set with an address assignment in the first set of addresses that differs from a standard address assignment of a register set for a UART corresponding to the I/O slot; and

a communications driver executed by the processing unit, the [communication] <u>communications</u> driver comprising a UART emulation which in response to an access targeted at a register set of a UART corresponding to the first communication port, converts the access as required for the register set and address assignment of the device.

2. (Un-amended) The system of claim 1, wherein the local bus comprises an ISA bus.

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3. (Un-amended) The system of claim 1, wherein the device coupled to the local bus, further comprises:

a comparator adapted for receiving a data signal from the local bus;

a pattern generator coupled to the comparator, wherein the pattern generator generates a signal for comparison with the data signal;

a counter operably coupled to the comparator, wherein the counter resets to an initial state following the comparator indicating the data signal is not equal to the pattern signal and advances toward a final state following the comparator indicating the data signal equals the pattern signal; and

a register coupled to the counter and adapted to receive a signal from the local bus, wherein in response to the counter reaching the final state, the register latches from the local bus a value which indicates the base address of the I/O slot occupied by the device.

4. (Amended Twice) A method for [communication] <u>communicating</u> between a computer and a device having an I/O interface which differs from the I/O interface of a UART, comprising:

coupling the I/O interface of the device to a local bus in the computer;

allocating in a memory of the computer, storage locations which correspond to registers of a UART;

<u>transmitting a packet formatted for a UART via a communications driver including a UART emulation;</u>

<u>updating a value in the storage locations according to a value in the packet via the UART emulation;</u> and

transmitting information via the local bus between the I/O interface of the device and the allocated storage locations in the memory of the computer.

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Please cancel claim 5.

6. (Amended Thrice) The method of claim [5] 4, wherein [the UART emulation] an I/O handler performs the step of said transmitting information by:

converting a value from the allocated storage to a converted value compatible with the I/O interface of the device; and

writing the converted value to a register in the device via the local bus.

7. (Amended Twice) The method of claim 4, wherein said transmitting information further comprises:

reading values from a register [of] in the device via the local bus; and

updating the storage locations according to the value read.

8. (Un-amended) The method of claim 7, further comprising transmitting from a communications driver to an application information from the storage locations.

9. (Un-amended) The method of claim 4, further comprising:

executing on the computer an operating environment which allocates I/O slots on the local bus for UARTs; and

setting a base device address for the device to correspond to one of the I/O slots allocated by the operating environment for the UART.

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10. (Un-amended) The method of claim 9, wherein setting the base device address comprises:

sensing, by the device, of a data signal on the local bus;

comparing the data signal to a signal from a pattern generator in the device;

advancing a state indicator toward a final state in response to the data signal being equal to the signal from the pattern generator;

repeating the steps of sensing, comparing, and advancing until the state indicator reaches the final state; and

setting the base address of the device to a value indicated by a signal on the local bus in response to the state indicator reaching the final state.

17. (Amended) A host signal processing modem comprising:

a device adapted for connection to a local bus of a host computer, wherein the device occupies an I/O slot on the local bus and is accessible at a first set of [address] addresses, the device having a register set with an address assignment in the first set of addresses that differs from a standard address assignment of a register set for a UART corresponding to the I/O slot; and

a communications driver executable by the host computer, the communication driver comprising a UART emulation, wherein in response to the host computer executing a procedure that targets an access at a register set of a UART, the UART emulation converts the access as required for accessing the register set and address assignment of the device.

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18. (Un-amended) The modem of claim 17, wherein the procedure that targets an access at the register set of a UART is part of an operating system that the host computer executes.

19. (Twice Amended) A communication [program] driver executable by a host computer running an operating system that assigns a first port to a UART, the communication [program] driver comprising:

a UART emulation that in response to a procedure requesting access to a register of a UART at a first port, instead accesses storage locations in a memory of the host computer; and

an I/O handler that transfers values between the storage locations and a register set of a non-standard device having an address assignment that differs from that of a UART, wherein the register set of the non-standard device physically occupies addresses corresponding to the first port.

Please cancel claim 20.

21. (Amended) The communication [program] driver of claim 19, further comprising modem software that implements a conversion between data and digital samples representing a signal in accordance with a communication protocol.

Please add new Claims 22-38.

--22. (New) The communication driver of claim 19 wherein the address of a first storage location corresponds to a line control register, the address of and a second storage location corresponds to a line status register.

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23. (New) The host signal processing modem of claim 17 wherein the register set includes a line control register, a line status register and a modem control register.

24. (New) A communication driver executable by a host computer, comprising a software modem.

25. (New) The communication driver of claim 24, further comprising software that accesses storage locations in a memory of the host computer in response to a call requesting access to a register of a hardware UART.

26. (New) The communication driver of claim 25, wherein the software modem converts between data and digital samples of waveforms in accordance with a modem protocol.

27. (New) The communication driver of claim 26, further comprising an I/O handler that transfers values between storage locations in the memory of the host computer and a register set of a non-UART chip in a peripheral device of a host computer.

28. (New) The communication driver of claim 27, wherein the peripheral device further comprises an analog-to-digital converter and a digital-to-analog converter.

29. (New) A system comprising:

a device comprising an analog to digital converter couplable to a communication medium to receive therefrom an analog communications signal; and

a computer comprising a processing unit coupled to the device, to receive therefrom a plurality of sampled digital values, the processing unit being programmed with a software modem to determine data received, based on a waveform represented by the sample digital values.

30. (New) The system of Claim 29 wherein:

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the processing unit is programmed with an operating system; and

the operating system supports a plurality of applications, at least one of the applications communicating with the software modem in the same manner as with a hardware modem.

31. (New) The system of Claim 29 wherein:

the device generates interrupts; and

the software modem reads a set of sampled digital values from the analog to digital converter in response to an interrupt.

32. (New) The system of Claim 29 wherein:

the device further comprises a digital to analog converter coupled to the communication medium to transmit thereto an analog signal; and

the software modem generates a series of digital values sent to the digital to analog converter for transmission as an analog signal on the communication medium, the analog signal providing a carrier signal and data values formatted according to a standard modem protocol.

33. (New) A method comprising:

converting an analog communications signal received from a communication medium into a series of sampled digital values, wherein said act of converting is performed in an analog to digital converter;

determining data received based on a waveform represented by the sampled digital values, and based on a modem protocol, wherein said determining is performed in a processing unit coupled to the analog to digital converter by a local bus of a computer, the sampled digital values being transferred from the analog to digital converter to the processing unit by the local bus; and

providing the data received to an operating system.

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34. (New) The method of Claim 33, wherein:

the analog to digital converter is a portion of a device that does not comprise a standard UART, and the method further comprises the processing unit determining if a non-standard UART device is present.

35. (New) The method of Claim 33 further comprising:

generating a series of digital values, in said processing unit; and

transmitting an analog signal based on the series of digital values, in a digital to analog converter, wherein said digital to analog converter is coupled to the processing unit by the bus.

36. (New) A communication device comprising:

at least one register couplable to a bus of a computer; and

an analog to digital converter couplable to a communication medium to receive therefrom an analog communications signal, the analog to digital converter being coupled to the register to provide thereto a plurality of sampled digital values representing a waveform in the analog communications signal.

37. (New) The communication device of Claim 36 further comprising:

a digital to analog converter coupled to the register to receive therefrom a series of digital values, the digital to analog converter being couplable to the communication medium to transmit thereto an analog signal, the analog signal providing a carrier signal and data values formatted according to a standard modem protocol.

38. (New) A computer comprising:

a processing unit and memory programmed with a driver, said driver comprising (a) a software UART coupled to an operating system, (b) a software modem coupled to the software UART, and (c) an I/O handler coupled to the software modem; and

a device that does not comprise a UART, the device being coupled to the processing unit by a local bus, wherein the device comprises an analog to digital

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converter that generates sample digital values, and the device transfers the sampled digital values via the local bus to the software modem.

39. (New) The computer of Claim 38 wherein said device is hereinafter "first device" and said driver is hereinafter "first driver", the computer further comprising

a second device comprising a UART, the second device being coupled to the processing unit by the local bus; and

a second driver comprising routines for accessing the second device.

40. (New) The computer of Claim 39 wherein:

said first device is coupled to an I/O slot corresponding to a first COM port; and

said second device is coupled to an I/O slot corresponding to a second COM port.

41. (New) The computer of Claim 40 wherein:

said first device occupies up to eight addresses on the local bus; and

said second device occupies eight addresses on the local bus.

42. (New) The computer of Claim 38 wherein:

the memory is further programmed with routines for accessing another device that comprises a UART.

43. (New) A computer comprising:

an analog to digital converter couplable to a communication medium to receive therefrom an analog communications signal and coupled to a local bus to transmit thereto a series of sampled digital values; and

a processor coupled to the local bus and programmed to:

determine data received based on a waveform represented by the sampled digital values and based on a modem protocol; and

provide the data received to an operating system of the computer.

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44. (New) The computer of Claim 43 wherein:

said processor is programmed to transmit a series of digital values on the local bus; and

the computer further comprises a digital to analog converter coupled to the local bus to receive therefrom the series of digital values and couplable to the communication medium to transmit thereto an analog signal based on the series of digital values.

45. (New) The computer of Claim 44, wherein:

the analog to digital converter and the digital to analog converter are portions of a first device that does not comprise a standard UART;

the computer further comprises a second device that comprises a standard UART; and

said processor is programmed to:

access the first device through the operating system and a software UART; and

access the second device through the operating system and a standard COM driver. --

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